

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A diagnostic system for a modular fieldbus board carrying a number of fieldbuses connected to a bulk power supply, comprising a monitoring transceiver means connected in use to two or more of the number of fieldbuses in which each connection to a fieldbus comprises two or more common mode and differential mode signal injection and/or signal detection points, which points are collectively formed to inject and/or detect both common mode and differential mode signals, and which points are located between the bulk power supply and a fieldbus trunk part of the fieldbus, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points, and in which the monitoring transceiver means is provided with a first digital and/or analog interface physically separate from the fieldbus trunk, and adapted to transmit diagnostic data detected by the monitoring transceiver means directly to an associated digital or analog device.

2. (Previously Presented) A diagnostic system as claimed in Claim 1 in which the fieldbus physical layer characteristics comprise one or more of: over/under termination, noise/ripple level, signal level, signal bias, signal jitter, signal ringing, signal distortion, signal attenuation, cross talk, unbalance, and earth leakage.

3. (Previously Presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means also detects one or more characteristics of hardware carried on the modular fieldbus board by means of one or more of said points.

4. (Previously Presented) A diagnostic system as claimed in Claim 3 in which the one or more characteristics of hardware comprise one or more of: voltage, short circuit, hardware module failure, quiescent current, and rate of charge.

5. (Previously Presented) A diagnostic system as claimed in Claim 4 in which the monitoring transceiver means is adapted to gather received data and produce one or more of: Fourier analysis, trending analysis, and data logging.

6. (Previously Presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means is adapted to provide an alarm in the event that received data indicates one or more of pre-determined failures has occurred on any of the two or more fieldbuses, and in which the first digital and/or analog interface is adapted to transmit said alarm directly to an associated digital or analog device.

7. (Previously Presented) A diagnostic system as claimed in Claim 1 in which the first digital and/or analog interface is adapted to receive operating commands from an associated digital or analog device.

8. (Previously Presented) A diagnostic system as claimed in Claim 6 in which the monitoring transceiver means is provided with a second digital and/or an analog interface, such that diagnostic data detected and/or alarm created by the monitoring transceiver means during use are transmitted to other associated diagnostic systems.

9. (Previously Presented) A diagnostic system as claimed in Claim 6 in which the monitoring transceiver means is provided with visual means adapted to display diagnostic data detected and/or alarm created.

10. (Canceled)

11. (Previously Presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means is connected to the bulk power supply.

12. (Previously Presented) A diagnostic system as claimed in Claim 1 in

which one or more of the two or more common mode and differential mode signal injection and/or signal detection points are disposed within hardware carried on the board.

13. (Previously Presented) A modular fieldbus board comprising
a backplane;

a number of fieldbuses mounted on the backplane, each fieldbus includes a connection to a bulk power supply, a power supply converter, a power supply conditioner and a fieldbus trunk, and

a monitoring transceiver means connected to two or more of the number of fieldbuses by means of two or more common mode and/or differential mode signal injection and/or signal detection points, and wherein the two or more common mode and differential mode signal injection and/or signal detection points are interposed between and/or within the bulk power supply, the power supply converter, the power supply conditioner and the fieldbus trunk, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said two or more common mode and differential mode signal injection and/or signal detection points.

14. (Cancelled)

15. (Previously Presented) A modular fieldbus board as claimed in Claim 13 in which, on each of the one or more fieldbuses, a first common mode signal injection and/or signal detection point is disposed between the bulk power supply and the power supply converter, wherein a second common mode signal injection and/or signal detection point is disposed between the power supply converter and the power supply conditioner, in which a third common mode signal injection and/or signal-detection point is the power supply conditioner and the fieldbus trunk, and a differential mode signal injection and/or signal detection point is disposed between the third common mode signal injection and/or signal detection point and the fieldbus trunk.

16. (Previously Presented) A modular fieldbus board as claimed in Claim 15 in which a fourth common mode signal injection and/or signal detection point is disposed within the power supply converter, and in which a fifth common mode signal injection and/or signal detection point is disposed within the power supply conditioner.

17. (Previously Presented) A diagnostics system as claimed in Claim 1 in which each of the two or more fieldbuses comprises a connection to the bulk power supply, a power supply converter and a power supply conditioner.

18. (Previously Presented) A diagnostic system as claimed in Claim 17 wherein, on each of the two or more fieldbuses, a first common mode signal injection and/or signal detection point is disposed between the connection to the bulk power supply and the power supply converter, wherein a second common mode signal injection and/or signal detection point is disposed between the power supply converter and the power supply conditioner, wherein a third a common mode signal injection and/or signal detection point is disposed between the power supply conditioner and the fieldbus trunk, and wherein a differential mode signal injection and/or signal detection point is disposed between the third common mode signal injection and/or signal detection point and the fieldbus trunk.

19. (Previously Presented) A diagnostic system as claimed in Claim 18 in which a fourth common mode signal injection and/or signal detection point is disposed within the power supply converter, and in which a fifth common mode signal injection and/or signal detection point is disposed within the power supply conditioner.

20. (Previously Presented) A modular fieldbus board comprising:
a backplane;
a bulk power supply;
a plurality of fieldbuses including a fieldbus trunk, mounted on the backplane, and connected to the bulk power supply;
two or more members selected from the group consisting of

common mode signal injection point,
common mode signal detection point,
differential mode signal injection point, and
differential mode signal detection point,

connected to each of the plurality of fieldbuses, wherein the points are formed to inject and/or detect both common mode and differential mode signals to each of the plurality of fieldbuses, and wherein the points are interposed between the bulk power supply and the fieldbus trunk; and

monitoring transceiver means connected to two or more of the plurality of fieldbuses by means of two or more signal injection and/or signal detection points, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points.

21. (Canceled)

22. (Previously Presented) The diagnostic system as claimed in claim 1 wherein the monitoring transceiver means is a segment autonomous diagnostic system.

23. (Previously Presented) A modular fieldbus board comprising a number of fieldbuses connectable to use to a bulk power supply, the modular fieldbus board is provided with a diagnostic system comprising:

a monitoring transceiver means connected to one or more of the number of fieldbuses, in which each connection to a fieldbus comprises one or more common mode and/or differential mode signal injection points and one or more corresponding common mode and/or differential mode signal detection points, in which said points are dispersed between locations at which the fieldbus is connectable to the bulk power supply and to a fieldbus trunk, and in which the monitoring transceiver means is adapted to detect one or more fieldbus physical layer characteristics between any signal injection point and any signal detection point.